Human Personality Types and Software Interface Design: HCI from a Different Perception

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Abstract— **This research discusses the issues of the incorporation of human personality types in the design of human computer interfaces. LEONARD, Let's Explore our personality based on Openness, Neutral, Analytical, Relational and Decisive is a personality instrument to conduct personality tests on human beings. The description and characteristics of LEONARD are also presented. An offshoot study was conducted on selected respondents to determine the appropriateness of incorporating LEONARD. This study, too, addresses the users' satisfaction of the incorporation of LEONARD in designing user interfaces. This is followed by a discussion of how the incorporation of LEONARD impacts user interface design. A conclusion is drawn on the appropriateness of human personality types and software interface design.**

Keywords— ***Human computer interaction, user interface, human personality types,*** **LEONARD**

INTRODUCTION

Human development is shaped by environment. Today the environment is changing more rapidly than ever before because it is driven by technological change. Therefore, it is essential that we understand the effects of technological change on information processing and human behaviour so that we can make best use of technology and prepare for its impact.

In information technology, the user interface (UI) is everything designed into an information device with which a human being may interact. This includes mouse, keyboard, screen, appearance of a desktop, help messages, special characters and others [1]. Thus, all of these invite interaction and response from it. It can be arguably said that the user interface includes the total "user experience," which may come in the form of aesthetic appearance of the device, response time, and the content that is presented to the user within the context of the user interface.

In short, interfaces serve as a bridge between man and computer by allowing information exchange between human and machine parties of man-machine system (MMS)

operation [2,3]. The real effectiveness of software applications depends on the acceptance and usability by the end user rather than computer professionals [4]. In recent years, criticism of the design of software interfaces and the features built into products have been stated in many articles. A 1992 critique stated that:

"A lot of new GUI products have become really, really hard to figure out. We keep seeing screens buried in layer upon layer of dialog boxes and windows, cluttered with randomly placed icons, file directories, pick lists, radio buttons, data entry fields, and other graphical furniture."

This is due to the fact that human factors have taken a back seat because of the rapid growth of web-based applications especially the rush to 'e-market' in the last 5 years. Therefore, the communication between the computer and its user must be easy, accurate, flexible, reliable and as quick as possible.

SIGNIFICANCE

Human-computer interaction (HCI) is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings [1]. Therefore, this study combines the

personality types of human beings (ie. the LEONARD) in the field of human computer interaction, in particular and computer science, in general. The incorporation of LEONARD in the design of user interface is one of the first in the field of human computer interaction.

Historically, computer system developers as well as designers have not paid much attention to the design of user interfaces. Many of us today, would argue that developers are still not paying enough attention to making their products "user-friendly" that cater for the different types of people. However, computer system developers might argue that computers are extremely complex products to design and make and that the demand for the services that computers can provide has always outdriven the demand for ease-of-use [1].

One important HCI factor is that different types of users form different conceptions or mental models about their interactions and have different ways of learning and keeping knowledge and skills (different "cognitive styles" as in, for example, "left-brained" and "right-brained" people; ie, different personality types). Another consideration in studying or designing HCI is that user interface technology changes rapidly, offering new interaction possibilities to which previous research findings may not apply. Thus, user preferences change as they gradually master new interfaces. As in the past, least attention has been paid to the human interface, as designers, developers and users focused on maximum functionality within cost and performance constraints.

Within the field of computer science, there is lack of awareness of the importance of user interfaces and the difficulties in building effective ones that cater for all types of people. Most of the software developers do not consider interfaces as part of the system and worse, the user is rarely considered [5]. Therefore, this situation can result in systems that are complicated and difficult to use unless serious measures are taken. Among them include the human factors such as the age, gender, ethnic groups and etc. as well as the personality type approach, ie. the Leonard Personality Inventory (LEONARD) of human beings. By considering all of these factors, it is best hoped that effective design of interfaces would emerge and result desirable software applications for all levels of users.

WHAT IS PERSONALITY TYPE?

Personality type is a theory of people's behaviour pattern developed by a Malaysian psychologist Leonard M.S.Yong to explain the normal differences between healthy people. Based on his observations, Leonard concluded that differences in behaviour result from people's inborn tendencies to use their minds in different ways. As people act on these tendencies, they develop patterns of behaviour [6]. He believed too, that people are innately different in what they prefer. Leonard's personality type theory defines five behavioural dimensions, namely Openness, Neutral, Analytical, Relational and Decisive as depicted in Figure 1.
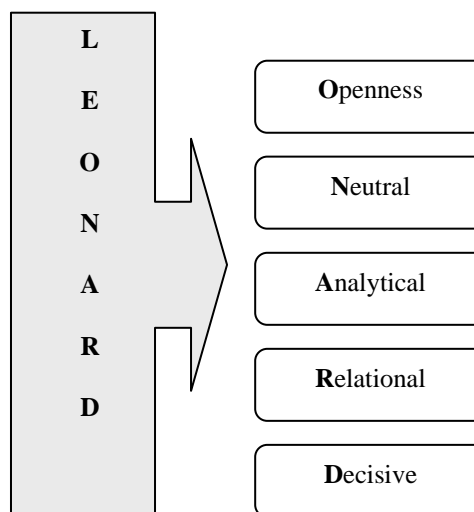

Fig.1: Behavioural Dimensions

DEFINITION OF LEONARD

Let's Explore our personality based on Openness, Neutral, Analytical, Relational and Decisive (LEONARD) is a Personality Inventory based on research work in the last ten years by a renowned Malaysian researcher. The instrument returns the respondent's main preferences on each of the five dimensions. Thus, the LEONARD describes sixteen main possible types such as shown in Table I.

TABLE I

Description of Leonard Personality Types

LEONARD PERSONALITY TYPES	
High Openness (O)	Creative Imaginator
High Neutral (N)	Neutral Expert
High Analytical (A)	Scientific Thinker
High Relational (R)	Relational Interactor
High Decisive (D)	Decisive Decision Maker
High Neutral & Decisive (ND)	Accomplisher
High Analytical & Relational (AR)	Assessor
High Relational & Decisive (RD)	Exhorter
High Neutral & Analytical (NA)	Error-Buster
High Neutral & Relational (NR)	Encourager
High Openness & Relational (OR)	Creative Relator
High Analytical & Openness (AO)	Creative Thinker
High Openness & Neutral (ON)	Creative Expert
High Openness & Decisive (OD)	Creative Decision Maker
High Analytical & Decisive & Openness (ADO)	Innovator

Types	Strengths	Weaknesses
High Openness (O) & combination of any other three dimensions	Versatile Person	

CHARACTERISTICS OF LEONARD

Some of the characteristics of the five behavioural dimensions are summarized in Table II.

CHARACTERISTICS OF LEONARD

Types	Strengths	Weaknesses
Openness	Adaptable/Flexible	Bored
	Creative/Strong imagination	Too inquisitive
	Curious	Finds others' ideas too shallow and unimaginative
Neutral	Accepts others' suggestions and ideas	Tends to compromise so as to avoid conflicts
	Supportive	Lacks confidence
	Requires a friendly atmosphere to work best	Shrinks from difficult situations
Analytical	Precise/Prefers to have established procedures to follow	Rather slow to respond to new ideas
	Likes information to be put down in black & white	Not flexible
Relational	Spontaneous	Restless
	Enthusiastic	Disorganized
Decisive	Loves challenges	Easily irritated
	Desires to be in control	Quite impatient

The above table can be used as a guideline to design interfaces based on one's preferences. However, it must be stressed that all types are good, normal, and none is superior to the others regardless of their strengths and weaknesses [7].

OBJECTIVE

The objective of this paper is to discuss how humans interact with computers, and how to design user interfaces that are easy, quick and productive for humans to use. This includes addressing the primary needs and perceptions of the creation of a web environment acceptable and usable to the different personality types of people. Therefore, one of the important challenges in this research to user interface design is how to help the novice user become quickly proficient and eventually become an expert user without the encumbrance of the training aids or manuals that were useful for the novice.

RESEARCH QUESTIONS

The research goal in the area of interface design using LEONARD is to discover helpful, unobtrusive, structured, and organized ways to integrate the use of principles, guidelines, standards, style guides, and design rules into the design process without stifling creativity [8]. Therefore, this leads to the question,

"What is the best presentation format for communicating design rules for people with different types of personalities and how could we ensure that they will be observed?"

The following questions, too, are directly related to this research:

Why should we consider incorporating LEONARD in user interface design?

How can we design applications that meet the needs of all types of users?

How can human personality types influence interface design?

Do different people need different designs of user interfaces?

Is it cost-effective?

RESEARCH METHOD

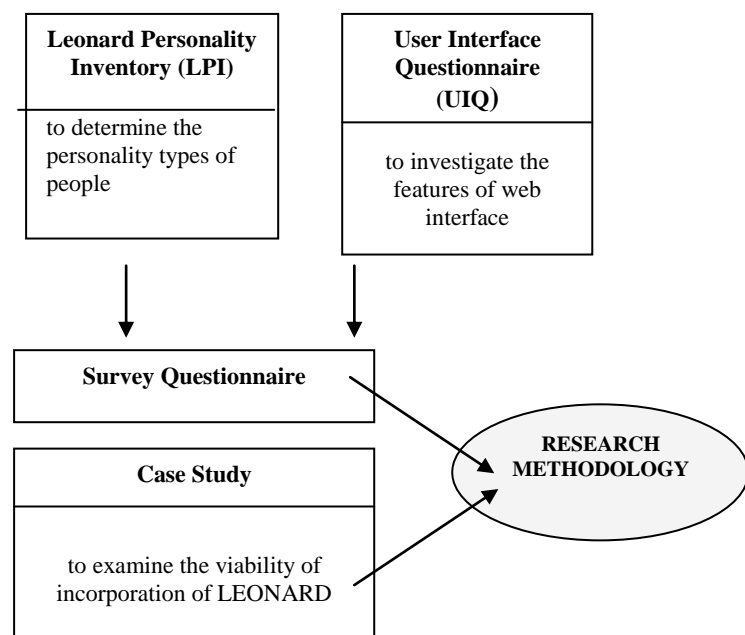Figure 2 depicts the methods that were undertaken in this study.

Fig. 2: *Components of Research Methodology*

SURVEY QUESTIONNAIRE

The research design or the unit of analysis – the object of attention in this research included the Malaysians; people with different cultural, socio-economic, educational, novice and experience computer users, the very young and elderly in various interaction contexts and scenarios of use. The variables that characterize and distinguish the different personality types of people such as gender, race, religion, education, personality types and others is focused on to discover relationships among those variables. Two written questionnaires were employed. The Leonard's Personality

Inventory (LPI) instrument identified personality characteristics and personality types, and the User-Interface Questionnaire (UIQ) addressed computer-user interface styles, interface displays, and the demographic variables of the study. This offshoot study was undertaken to determine the human personality types of people as well as the features of user interface that 'appeal' to them. A random sample of four hundred people was selected to participate in this study. Of the four hundred respondents, 250 respondents were male and the remainder was females. The data were collected over a three months period. The data were tabulated and analyzed using a statistical package. The offshoot study undertaken showed that most of the respondents were in the O, N, A, R and NA types. All the respondents strongly agreed that human personality types should be taken into consideration in designing user interfaces.

CASE STUDY

Case studies were also undertaken to ensure the appropriateness and to determine the respondents' attitude towards the incorporation of LEONARD. A group of forty-five students at a university participated in this study. Ninety-five percent of the students strongly agreed to the incorporation of LEONARD.

HOW LEONARD IMPACTS USER INTERFACE DESIGN

Effective interaction with users – Learning styles differ between ethnic groups as well as gender. Therefore, by offering users effective designs of interfaces, users with different learning style preferences and skills may have a better opportunity to discover what best fits their own strengths, needs, and weaknesses [9]. Thus, a good interface should successfully interact with the intended users and stimulate their mind in grasping the materials or the context of the text in a software application.

User-centered design process – Applying type for designing effective interfaces for specific software applications can move us from irritation with the acceptance of people's differences. Software developers and user interface designers will be aware of the characteristics of various people before designing user interfaces. They will focus on the users' personality types and keep the user interface simple and obvious.

User satisfaction – It must be accepted that some people are very intimidated by computers. The sheer mystery of how computers work and the seemingly endless cryptic commands and messages seem to conspire to frustrate their efforts and desire to learn more. Thus, by designing user interfaces based on their needs will maximize the likelihood of user satisfaction and possible returns to a web site. Therefore, the use of computers will be expanded to a larger portion of the population.

Cost-effective – Designing a user interface for an application is not an easy task as users considerations need to be undertaken seriously. Therefore, developing user interfaces for several personality types is not cost-effective.

In short, the incorporation of LEONARD in user interface design should be viewed as a new paradigm shift in human computer interaction studies. We believe the user interface embodies the data and functions of computer-based products and provides a basis for the product's usability and commercial success.

CONCLUSION

It can be argued that there are a number of implications of these findings. The key theoretical implication is that personality is powerful and easy to manipulate even in its simplest form, it can provide complex social behaviour. However, it is hoped that this research will enable equitable access and active participation of potentially all types of people in existing and emerging computer-mediated human activities. With this, and keeping users in mind, we may be at the forefront of a new paradigm in the design of user interface for the different personality types of people. We believe that through the understanding and application of these concepts; it may be a key to expanding the use of computers to a larger portion of the population.

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